



McLane and Goldman Dams Removal Feasibility Study Project Introduction

The Town of Milford and Estate of Helen Goodwin¹ are exploring the possibility of removing the McLane Dam (located near the Swinging Bridge, off Bridge Street) and the Goldman Dam (just downstream of the Stone/Route 13 Bridge).

In order to make the best-informed decisions regarding these dams, the Town has contracted with Gomez and Sullivan Engineers to conduct a dam removal feasibility study to determine if the option to remove both dams is prudent, feasible and cost effective (the funding for this study has come predominantly from grants). The report will review, compile, and relay data on all major areas of concern such as natural resources, water quality, transport of contaminated sediment contamination, hydraulics, infrastructure, economics, archeological and historic resources, endangered species, flooding, etc. Once finalized, the draft feasibility report will be presented at a well-publicized meeting and the public comments period will begin. All comments received will then be incorporated into the final report, which will be presented to the public. [Currently, the timeline for the completion of the report and subsequent presentations to the public are dependent on the development of data/reporting from agencies beyond the direction of the Town or Gomez and Sullivan Engineers, as is further explained later in this project update].

For each of the dams there are multiple reasons the Town and Estate of Helen Goodwin¹ are considering their removal. The area in and around the McLane Dam consistently draws the undesired attention of local children and teenagers for swimming, jumping, and climbing, and the Goldman Dam has known structural deficiencies; both situations create safety and/or liability issues.

Neither dam mitigates flooding or is utilized for any operational purpose. From a financial perspective, the dams require ongoing permitting, maintenance, and repairs costs, though they do not add practical benefit to the Town's infrastructure system.

Additionally, the New Hampshire Department of Environmental Services (NH DES) has notified the town that the areas of water held back by the dams (these types of waterbodies are called dam impoundments) have water quality issues significant enough to require action and are listed on the State of New Hampshire's 303(d) list of impaired waterbodies. The 3-acre McLane Dam impoundment has dissolved water oxygen levels too low to support fish and aquatic plants long-term. In addition, bacterium levels in the water are consistently high enough that this section should not be used for swimming, etc., though throughout the summer this location is frequently used by children as a swimming area. The 8-acre Goldman Dam impoundment has dissolved water oxygen levels too low to support fish and aquatic plants long-term. Both dams also prevent the upstream movement of migratory and resident fish (in 2008, the Merrimack Village Dam was removed, which now makes the McLane Dam the first barrier to fish passage on the Souhegan River).

In the converse, the current visual elements of the river have been enjoyed unchanged for many years, and concerns have been raised that removing the dams would cause undesired visual changes that would be too significant for dam removal to be warranted. Aspects of the report will convey information on how the look of the river would change if the decision is made to remove the dams.

Following is a dam removal feasibility study project update completed by Gomez and Sullivan Engineers. The various activities required to complete the study are grouped together into categories of similarity; these categories are called Tasks.

[¹The Town of Milford owns the McLane Dam and the Estate of Helen Goodwin owns the Goldman Dam. The beneficiary of the estate is a minor (a child), with insufficient means to maintain or repair the Goldman Dam. The Town has communicated with the Estate of Helen Goodwin and they have indicated that they support the Town participating in a dam removal feasibility study and articulated their desire for the Goldman Dam to be included in the study as well.]

McLane and Goldman Dams Removal Feasibility Study Project Update (April 10, 2013)

Status Summary

Milford contracted with Gomez and Sullivan Engineers (G & S) to complete the McLane and Goldman Dams Removal Feasibility Study. The work was initiated in late 2011; the bulk of the study is complete. The project has been on hiatus since late 2012, while the US Environmental Protection Agency (EPA), as part of the Fletcher's Paint Superfund site, resolves issues relative to contaminated sediments (PCBs) located within the impoundment created by the Goldman Dam.

G & S has indicated that allowing the sediments (sand and silt) accumulated in the Goldman Dam Impoundment to naturally transport downstream following dam removal does not pose an aquatic or human health risk, so long as PCB laden sediments are cleaned up to a standard of 0.5 parts per million (ppm) prior to dam removal.

In 2012, the EPA conducted an extensive sediment sampling event above the Goldman Dam to assess current PCB contaminations levels as an aspect of the Fletcher Paint Superfund site cleanup. The EPA is currently processing that data and they are using it to develop a record of decision (ROD). This will be their "action plan" for sediment management. It will indicate if they need to remove any sediment from the riverbed, or if the levels of contamination are low enough that they feel it is safe to allow the sediment to remain where it is and naturally transport downstream – regardless of if the dams remain or are removed.

The EPA has indicated that they will have a ROD with a final action by September 2013, to resolve how they intend to handle the PCB laden sediment within the Goldman Dam Impoundment. At issue is the EPA clean-up standard. EPA's clean-up standard is based on human health risk; not aquatic resource risk (such as fish). Concurrently, the New Hampshire Department of Environmental Services (NH DES) considers risk to both humans and aquatic resources, as part of dam removal projects in context with the Section 401 Water Quality Certification. In general, aquatic resources have a higher sensitivity than humans.

Following the completion of the G & S dam removal feasibility study, if the town and/or the Estate of Helen Goodwin¹ decide to remove the dam(s), EPA's action in regards to the sediment will directly impact sediment management alternatives and costs at Goldman Dam (see Task 90). If sediments are not cleaned up to 0.5 ppm prior to a potential dam removal, then allowing sediments to naturally transport downstream upon dam removal may present risk to aquatic resources. As such, it may require dredging and proper disposal of contaminated hot spots, which would add significant costs to the dam removal project. Alternatively, if sediments are cleaned up to the 0.5 ppm threshold, the proposal would be to allow the sediments to naturally transport downstream upon dam removal.

In sum, EPA will be providing their proposed action relative to the Goldman Dam sediments no earlier than September 2013. Once EPA's decision is made regarding the sediment their decision will be reviewed by NH DES to determine if the EPA sediment management plan will be acceptable in accordance with the NH DES Section 401 Water Quality Certification, as it pertains to the dam removal alternative. Following concurrence between EPA and NH DES, G & S will finalize the sediment management alternatives for inclusion in the study, dam removal cost estimate will be developed, and a draft feasibility report will be submitted to the town and public. Thereafter, a public meeting will be held to review the draft feasibility report findings. The draft feasibility report will be updated based on public

input and comments and a final feasibility report will be developed. Assuming EPA has their ROD by September 2013 and concurrence on the sediment management plan is achieved between agencies, the draft feasibility study should be complete by the first quarter of 2014. At that time, the town will plan the public meetings, comments period, etc., and dates/schedule for final decision will be set.

Described below are the tasks involved with the dam removal feasibility study and a short summary of the work completed.

Task 10. Existing Data Collection, Review and Technical Summary Memorandum (complete)

This task entailed collecting available background information on the project such as: flood insurance studies of Milford, existing water quality data, information on the Stone/Route 13 Bridge, existing information on the Fletcher's Paint Superfund Site, plan and profile drawings of water and sewer lines traversing the Souhegan River in the project area, and historic information on ice jamming.

Task 20. Field Survey and Base Mapping (complete)

This task developed dam removal design plans and dam removal cost estimates, a field survey was conducted to develop an existing conditions plan, which shows the plan and profile of the dams, topography along the sides of the dams/river, and other critical infrastructure features (sewer/water lines).

Task 30. Bathymetric Mapping and Sediment Thickness Mapping (complete)

Bathymetric mapping was obtained in the McLane and Goldman Dam impoundments. A bathymetric map is the same as a topographic map; it simply represents the topography beneath the water. The bathymetric mapping is used to develop a hydraulic model of the river as described below. This task also included sediment thickness mapping along 10 evenly-spaced cross-sections in the McLane Dam Impoundment. The sediment thickness mapping provides information on the quantity (cubic yards), composition (sand, silt, gravel, etc.) and location of sediment that could potentially become mobilized if the McLane Dam is removed. Existing sediment thickness mapping above Goldman Dam had been previously completed by the EPA, as part of the Fletcher's Paint Superfund site.

Task 40. Wetlands Delineation and Rare, Threatened and Endangered Species, and Invasive Species (complete)

As required for permits for deconstruction (should the decision be made to remove the dams), a wetland delineation was conducted. Also, the US Fish and Wildlife Service (federal) and NH Natural Heritage Bureau (state) were contacted relative to threatened and endangered (T&E) species. No T&E species were identified in the project area.

Task 50. Sediment Sampling Plan, Field Sampling, Lab Analysis, Interpretation of Sediment Findings (complete) and Task 190. Dilution and Attenuation Evaluation of PCBs (incomplete)

Part 1: For the McLane Impoundment, a sediment sampling plan was developed. Five sediment samples (a core of the sediment) were taken in the McLane Impoundment. In addition, sediment samples were collected in the riverine (free-flowing) sections of the Souhegan River well upstream of the Goldman Impoundment and downstream of the McLane Dam. These samples were used to identify if there are any contaminants above and below the project area. The purpose of testing this sediment for contamination is to understand the potential risk to aquatic and human resources, and to help develop the best sediment management options possible. For example, if the sediments are considered "clean" a potential viable option is to allow the sediment to naturally move downstream after dam removal. Alternatively, if the sediments are at levels of concern, then dredging and proper disposal of the sediments may be required.

Each alternative directly impacts dam removal costs. The sediment samples were collected and sent to a certified laboratory for contaminant testing. The lab results were then evaluated for both aquatic and human health risks.

Extensive sediment sampling had been conducted in the Goldman Dam Impoundment by EPA as part of the Fletcher's Paint Superfund site, thus it was not necessary for G & S to conduct sampling. However, this work conducted by EPA has provided beneficial information and is valuable to the overall feasibility study.

Part 2: Based on consultation with state and federal agencies, a dilution and attenuation evaluation was conducted. Simply put, this evaluates if the sediments were allowed to naturally migrate downstream after dam removal resulting in the mixing and dilution of sediments, would it still pose an aquatic or human health risk. The analysis indicated that if the McLane Dam sediments were naturally transported downstream upon dam removal, the risks to aquatic resources and humans are acceptable. At Goldman Dam, the findings indicated that the EPA would first need to clean-up PCB laden sediments to 0.5 ppm. Following cleanup, if post-remediated sediments are transported downstream upon dam removal, the risk to aquatic resources and humans are acceptable. Further assessment may be needed pending the EPA's ROD.

Task 60 and 70. Hydrology and Hydraulic Model (complete)

Hydrology refers to the magnitude of flow, typically expressed as cubic feet per second (cfs). A hydraulic model predicts the river depth, velocity and area of inundation under a range of flows. A hydraulic model was developed, starting from below McLane Dam and continuing upstream to Gregg Crossing (the footbridge at Keyes Field), which is the approximate upstream extent of the Goldman Dam Impoundment. Various scenarios were simulated in the model to evaluate if fish could pass through the project area, unimpeded, if the dams were removed. The hydraulic model was also used to evaluate the area of flood inundation above each dam under 100-year flood conditions with and without the dams to determine if dam removal would reduce the area of inundation or flooding that occurs.

Task 80. Sediment Transport and Scour Analysis (complete)

This evaluation included estimating the amount (cubic yards) of sediment behind each dam that would be naturally transported downstream following dam removal. The scour analysis included an evaluation of infrastructure - such as the Stone/Route 13 Bridge pier and abutment (keep in mind that this bridge was built after the dams were constructed) - that could be impacted due to removal of either dam. With the dams in place, it creates a backwater with slow moving water. If the dams are removed, the impounded areas that are slow moving will revert back to a free flowing river.

Task 90. Sediment Management Alternatives (incomplete)

The proposal being considered is to allow the sediments to naturally transport downstream following dam removal; however, the town has not received final input from state and federal agencies on the proposal due to the incompleteness of work associated with task 50.

Task 100. Bridge/Foundation Wall Inspection and Evaluation (complete)

This work included an evaluation of infrastructure primarily in the Goldman Dam area that is located adjacent to the river. Specifically, it includes the many foundations that line the river upstream and downstream of the Goldman Dam.

Task 110. Project Area Aquatic Species, Fish Passage, Recreation (complete)

This included a summary of recreational opportunities, and ability of fish to pass through the project area if the dams are removed.

Task 120. Habitat Mapping 1,000 feet below McLane Dam (complete)

This work included mapping habitat (pools, runs, riffles, channel bed composition, etc.) that fish would utilize below McLane Dam - as this area would temporarily be impacted if impounded sediments are allowed to naturally transport downstream upon dam removal.

Task 130. Cultural Resource Study - Archeological and Historic Structures Assessment (complete)

This work included an assessment of the dams' eligibility for the National Register of Historic Places and archaeological resource sensitivity.

Task 140. Draft Feasibility Report (incomplete)

The draft feasibility report is approximately 75% complete. It has not been provided to the town or other entities for review or comment.

Task 150. Final Feasibility Report (Not Started)

Task 160. Progress Report Meetings (incomplete)

Updates on study progress have occurred via meetings and conference calls with Project Partners since project initiation. It is expected that progress meetings/conference calls will occur, as needed, until completion of the dam removal feasibility study.

Task 170. Public Outreach Meetings (incomplete)

Public outreach meetings have occurred at the Town Hall, Granite Square Senior Apartments and Milford Mill Senior Apartments. At least two additional meetings are anticipated including one after the draft and final feasibility reports are issued.

Task 180. Description of Projected Timeline for Final Engineering and Permitting (Not Started)

Task 190. Dilution and Attenuation Evaluation of PCBs (incomplete)

See Task 50.

Should you have any questions regarding the study, please feel free to contact the Administration Office directly at 249-0601. We thank you for your interest and participation.